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THREE EXPERIMENTAL STUDIES IN PSYCHOLOGY

Conducted and Edited by

Professor L. R. GEISSLER, Ph. D.

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Three Experimental Studies in Psychology

Conducted and Edited by DR. L. R. GEISSLER

I.—THE INTERPRETATION OF THE HUMAN FACE FROM PHOTOGRAPHS

Dorothy V. Pope, '22, *Experimenter*

It is frequently observed in hearing or reading accounts of a public gathering that the audience is referred to as "intelligent looking." Again, one often hears persons described as having an "intelligent looking face" or as being "musical looking," "artistic looking," "literary looking," "scientific looking," or as having an "honest, open countenance" or as "mean looking," and the like. The question then arises: To what extent is it possible to judge a person's traits from a study of his facial features? Is it possible to find any positive correlation between the face and the talents of a stranger? The present study was undertaken with such questions as these in mind, and in particular we wished to find out whether the interpretation of the human face from photographs is accomplished by the average intelligent person as easily as by one trained in judging intellectual achievement and interpreting faces, and whether such factors as the sex or age of the judge have any effect upon the judgment or interpretation.

Our problem is neither new nor original, for the science of physiognomy has for centuries been concerned with discovering the relations between the human mind and its outward expression. This science, which seems to be as old as occidental civilization, has had in its development an alternation between periods of being in favor and periods of being in disrepute; but the fact that age can neither exhaust nor destroy its possibilities forces us to believe that its problems are worthy of further attention and study.

The first systematic effort to collect the facts concerning the relation between mental traits and facial features is attributed, whether rightly or wrongly, to Aristotle, in the fourth century B. C. He enumerated three principles of analogy, by means of which the relation is to be studied. The first one tries to draw

a parallel between the features of certain animals and their most distinctive characteristics and assumes that human beings exhibiting similar features will possess the corresponding animal characteristics. The second principle applies in a like manner to the distinctive characteristics and features of different human races, while the third principle makes use of the faces, drawings, paintings, or busts of the most prominent personages known to his time.

Early Christianity scorned any study of the sinful flesh and physiognomy fell into discredit, to be revived by Leonardo da Vinci, who wrote several treatises on it in the sixteenth century and also utilized its facts and principles in re-establishing the art of portrait-painting. During the 17th century physiognomy again fell into disfavor, due to the fact that it became associated with the pseudo-sciences of the day. But in the 18th century Lavater, an influential preacher from Zurich, in Switzerland, brought about a revival of interest in the subject. Schiller and Goethe were both deeply interested in it and wrote essays upon the relation of features to traits of character. About the same time the anatomist Camper in Holland was attempting to prove that intelligence was indicated by an angle formed by two lines, the one from the ear to the base of the nose, the other tangential to upper teeth and forehead. It has since been proven, however, that Camper's angle is of no importance psychologically. In the nineteenth century interest in physiognomy centered in mimicry in particular. Here we find Deschenne experimenting upon facial movements as stimulated by electricity, Lombroso studying the features of criminals and genius, while Darwin published an important work on "The Expression of the Emotions in Man and Animals."

Today the interest in physiognomy is probably more widespread than at any previous period, perhaps partly due to the rapid advances made in photography. Employers and employment-managers desire either personal interviews or at least a photograph of the applicant. Phrenologists, palmists, and other types of pseudo-scientific character-readers, including the professional interpreters of handwriting and photographs, are prospering everywhere by taking advantage of the popular interest in character-study. Yet at the same time we find serious-minded persons with scientific curiosity demanding or attempt-

ing a true scientific solution of the age-old question concerning character-traits and their outward expression, and psychology, the study of mental life par excellence, can no longer maintain an academic aloofness towards such questions as these: Is there any relation between the seen and the unseen? Do outward signs reveal the characteristics of the inner life? If there is a relation, how far does it extend? Does it involve only the fleeting expressions or are the static features of a person also indicative of certain inner traits? Can some persons judge better than others by facial expressions? Does the possession of a trait make one a better or worse judge of the same trait in others? Is it possible to train one's self in judging others by their facial expressions? Are persons of one sex or of one age better or worse judges of the same or of the opposite sex or of some different age?

In our experiment we have attempted to throw light on only a few of these questions. We desired to ascertain whether or not the casual observer has any basis upon which to form a judgment of other person's intelligence from their photographs, whether experience in judging intellectual progress renders one's judgment in facial expression more correct or not, whether or not a person is judged best by others of his own age or sex, and whether or not some particular traits, like musical, artistic, literary, or scientific talent are revealed more definitely than mere general intelligence in one's facial expression. We are well aware of other experimental studies along some of these lines, for instance, by Hollingworth of Columbia University, Pintner at Ohio State University, and most recently Anderson of Carnegie Institute of Technology, Pittsburgh, but space forbids us to give here a summary of their results, especially as they do not contradict our own findings where they meet on common ground.

Since it seemed desirable for our purposes to have as nearly uniform and constant material for judgment as is possible to obtain, we selected fifty photographs of members of a former graduating class of Randolph-Macon Woman's College who were of approximately the same age as the majority of our judges. Another uniformity was the fact that all fifty wore the academic cap and gown. Furthermore, we eliminated from the whole class all pictures giving near or full profile views. All pic-

tures were also of the same size, namely 1¾x2½ inches, and represented approximately bust-length. These pictures were mounted on a grey cardboard and the whole enclosed in a frame under glass, about 20x25 inches. The photographs were arranged equidistant from each other, in six rows of nine each, except the first and last row, which had only seven, thus leaving the corners free. These pictures had been cut from the class annual and were printed on uniform paper. The collegiate records of these fifty graduates were available for the whole four years of their college work, besides many other items of information concerning their non-scholastic activities.

The subjects who were to serve as judges of these photographs were forty students of the same college, five members of the college faculty, only one of whom was a man, and five members of the administrative staff. Besides these fifty, all of whom were unacquainted with the former graduates, three others served as judges who had been acquainted with the majority of the former class, namely a professor, a student and a staff-member. The experimenter takes this opportunity to thank each and all of these judges, whose faithful work has contributed much to whatever success this study may have attained.

The traits to which the experiment was confined were general intelligence, as represented by scholastic records, musical ability, literary ability, artistic ability, scientific ability, besides neutrality or absence of pre-eminence in any of these traits. The test was given to each of the 53 subjects individually, and in no case occupied more than 45 minutes.

The subject was seated at a table beside a window and given the following instructions to read:

"This is an experiment in the psychological study of facial types. It is our problem to ascertain to what extent persons agree in their interpretation of photographs. You will be shown a group of fifty photographs of members of a former graduating class of R. M. W. C.

1. Examine carefully the whole group and then try to determine the photograph which indicates to you the highest type of intelligence as usually measured by the best scholastic record. Place on this photograph the small white cardboard labelled No. 1.

2. In the same way select from the remaining photographs the one most intelligent looking face and place upon it card No. 2.

3. In this way proceed until all pictures are numbered from 1 to 50. After your ranking has been recorded all cards will be removed and you are to study the faces again in order to look for various other types of ability.

4. Determine which of the faces appears to you to indicate the highest type of musical ability. Place upon it the small card No. 1. Then look for the next highest type and cover it with card No. 2. In the same way select the photograph to be labelled No. 3.

5. After these three cards have been removed, proceed in a similar way to determine the three highest types of literary ability.

6. Do likewise with the ability in the art of painting.

7. Proceed in the same way to determine scientific ability.

8. Finally, select three faces which appear to you to be most neutral, that is, not expressing any kind of special ability or talent.

9. Fill out the items called for on the back of your Result-Sheet.

10. Please do not discuss the nature of this experiment with anybody, as this might disqualify others from participating in this experiment, in other words, please pledge yourself to silence in this respect.''

It can be seen from these instructions that only the minimum amount of information was given to the judges, in order to eliminate the possibility of suggestion. When the subject had finished the reading of these instructions, the picture-chart was placed on the table before him and he was given the small cards bearing the numbers from 1 to 50. As soon as each set of ranking was completed, the experimenter recorded the results upon a special blank form containing 50 rectangles arranged like the chart, and also three columns for the three highest ranks in the five special abilities. On the back of these result-sheets a number of questions appeared which each judge was asked to answer. They were as follows:

1. Name: 2. College class : 3. Age:

4. Vocation or major study:

5. Special interest in such subjects as: Music, Art, Literature, Science, etc.:

6. Are you familiar with any of the persons represented upon the picture-chart? If so, which?

7. Are you aware of any factors which have prejudiced your judgments? If so, describe fully and cite the cases:

8. Please add any comments on the experiment which will help in the correct interpretation of your results:

9. Pledge to silence:

After the test had been given to all 53 subjects, the experimenter consulted the collegiate records of the fifty graduates represented on the picture-chart and computed for each the average collegiate grade based on all four years of college work. On the basis of these average grades the objective rank in general intelligence was determined for each of the fifty photographs. Likewise the experimenter computed separately for each photograph the number of collegiate courses taken and the average grade obtained in the major subject, in art, literature, science, and music. From these records the three highest were selected as the objective representatives of the musical, literary, artistic, and scientific type, while the objective neutral types were taken to be those students showing the smallest differences in grades between their leading subject and the other groups of subjects as well as the general average. These objective rankings, as based upon the collegiate grades obtained by the fifty graduates, were then compared with each of the 53 subjective rankings made by our judges and the degree of resemblance expressed by the Spearman footrule of correlation, according to which resemblance may vary between +1.00 and —1.00. No resemblance or almost none is therefore 0 or a very small positive or negative fraction, while high degree of resemblance between objective and subjective ranking would be expressed by a fraction approaching +1.00, and likewise a high degree of opposition would be indicated by a fractional value which is

almost —1.00. In accordance with Spearman's formula we computed the correlation-coefficients or degrees of resemblance between the objective and the 53 subjective rankings and tabulated them.*

An inspection of these results shows that the magnitude of the 53 degrees or correlation-coefficients varied between +.24 and —.20, that three judges gave absolute 0 as coefficients, while 31 judges gave coefficients smaller than .1. Of the remaining 19 judges 14 gave positive degrees varying between .10 and .24, and the other 5 gave negative degrees varying between .10 and .20. The obvious conclusion is that none of our 53 judges ranked the photographs in a way resembling to any high degree the objective ranks. Only 14 of our judges gave correlation-coefficients, both plus and minus, which have the required fair degree of mathematical reliability, namely the magnitude of .13, and as five of these were minus, there remain only the results of nine judges as giving a fairly reliable, although but slight degree of resemblance between their subjective rankings of the photographs and the objective ranks of the 50 graduates as measured by their collegiate average grades. Of these nine judges only four belong to the 40 students who participated in the experiment. The remaining 36 members of the student-body gave thus either entirely negative results or too small a positive degree of resemblance. Likewise the five members of the administrative staff gave similar inconclusive results. Four members of the Faculty gave the following degrees of resemblance, respectively, +.13, +.13, +.16 and +.13. The three special subjects selected because of their familiarity with many members of the old class gave as degrees of resemblance 0, +.05, and +.19, the latter was also a lady of the Faculty.

We likewise listed the results of the ranking in the special abilities for Music, Literature, Art and Science as well as the "Neutral Type." It will be remembered that the judges were to select only the three highest ranks of each type. In order to

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The tabulations have been omitted from all 3 studies, but interested readers may obtain copies by addressing Prof. L. R. Geissler, Box 283, R.-M. W. C., Lynchburg, Va.

summarize these ranks for any one photograph, we assigned to rank 1 a value of 3 points, to rank 2 a value of 2 points, and to rank 3 a value of 1 point, and then multiplied these points by the number of times that a photograph received each rank and added the three products into a Total Number of Points which is to be compared with the objective collegiate records.

To take first the Musical Type, our results show that photograph No 15 received a total of 59 points, the largest number of points accorded to any of them. The person represented by this picture actually, according to the collegiate records, received objectively the second rank in musical ability, which seems to speak in favor of the possibility of selecting the musical type from the facial expression alone. On the other hand the photographs of the persons who objectively received the first and third rank were accorded by the judges of their facial expressions only 6 and 4 points respectively, while photograph No. 27 received the second largest number of points, namely 34, and No. 40 had 28 points. Furthermore, the photograph of No. 15 received also the largest number of points as Artistic Type, while it was given no points for Scientific Type and but 6 and 3 for Neutral and Intellectual Type. It seems evident, therefore, that this particular face has made a fairly correct impression upon a large number of judges, namely upon 40 out of 53, and it is coincidences of this nature which serve to confirm the popular notion that certain types of mental ability can be recognized from their facial expressions, while the negative instances of failure of recognition easily escape attention and notice.

In the case of the Literary Type not one of the three photograps which many judges selected as deserving first, second, and third rank were objectively ranked among the three highest. The same is true for the Artistic Type. Since musical ability, literary ability, and artistic ability may be grouped together as special forms of the general aesthetic type of mind, we have totalled all the points received by each photograph under the three special types and found that No. 15 received 100 points and that the third largest number of points belongs to photograph No. 17, whose representative received

objectively the second rank as literary type. In these two cases then we find the nearest agreement between objective ranking in aesthetic abilities and the subjective ranking as based merely on facial expression.

If we now examine the other three types of mind, we find very similar results as regards lack of agreement between objective and subjective ranking. Again we have two cases of fair agreement, one in the Scientific Type where photograph No. 24 received objectively first rank and was given by the judges the second largest number of points, namely 24, and the other case in the Neutral Type, where photograph No. 30 had objectively and subjectively first rank, although the number of points were only 16. Combining now these three mental types into a non-aesthetic type we find again that photograph No. 24 receives the highest number of points, namely 67, but otherwise there is no agreement between objective and subjective ranking.

It can also be readily shown that certain facial types have made a rather deep impression upon our judges, but that the latter do not agree in the interpretation of these faces, while other faces have been hardly noticed. This becomes evident when all points accorded each face are added together. From this computation it appears that the most striking or impressive faces are those of Nos. 15 and 17, with No. 24 as third. On the other hand the three least impressive faces are those of Nos. 50, 41, and 3, which received only 6, 7, and 9 points respectively. However, the one outstanding fact from these comparisons is that the faces of the persons who objectively have attained the three highest ranks in the various mental abilities have not been selected as such by our judges, with one or two exceptions.

It seemed also important to ascertain to what extent our judges agreed with each other in their judgment of faces, irrespective of the consideration whether their judgments were mistaken or not as compared with objective records. For this purpose we tabulated the frequencies with which each of the judges ranked each of the fifty photographs in intelligence, so as to show how often any given photograph was assigned any one of the fifty ranks. Thus a clustering of these figures,

as in the case of photograph No. 17, would mean that many judges give to a certain photograph very similar ranks: for example, No. 17 was given rank 1 by 4, rank 2 by 3, rank 3 by 4, rank 4 by 6, rank 5 by 3, rank 6 by 4 judges, and so on, while no judge ranked it as 8, 13, 17, 20 to 25, 28 and 29, and so forth, and only a few scattered votes were given for ranks below 14. This example shows at the same time the highest degree of agreement amongst the 53 judges. The distribution of the ranks ascribed by the 53 judges to the same photograph was also expressed in a single value obtained in this way: the frequency of each rank is multiplied by the rank, these products are then added and divided by 53, the number of judges, thus resulting in an averaged rank. On the basis of these values, the photographs are then re-ranked from lowest to highest, giving thus the pooled ranking of all the judges of all the photographs. This pooled ranking may also be compared with the objective ranking by the same Spearman formula, and will result in a degree of resemblance or correlation coefficient of +.06, which shows that there is as little resemblance between the pooled and the objective ranking as was found between the objective ranking and the subjective rankings of the 53 judges taken individually. In other words, not even the averaged opinion of many judges concerning intelligence as based merely upon facial expression has any value whatsoever as compared with the objective facts revealed by college achievement. A mere glance at the scattering judgments would convince anyone of the futility of trying to estimate another person's intelligence by an examination of his facial expression.

We shall now present the main results revealed by the answers of our 53 judges to the various questions presented to them after completing the ranking of the photographs.

These answers throw some light upon the reasons why so many people believe in the possibility of reading personal traits from facial expression. For instance, there seemed to be a distinct tendency among many of our judges to notice resemblances between the photographs and persons of their own acquaintance, although the comment was often added that they did not think this resemblance had prejudiced them. However, if these acquaintances should possess one of the mental

traits studied in this experiment, the conclusion seems obvious that the photographs resembling them might also possess that trait, and so judgment may frequently have been influenced by such considerations.

It also happened that photographs Nos. 11 and 31 were recognized by several, the former by 15, the latter by 11 judges, while 19 other photographs were familiar to one or two judges.

Other considerations influencing our judges in their interpretation of the photographs are revealed in the following quotations from the answers to our questions; especially questions 7 or 8:

Judge No. 41. Slight resemblance to people I have known. Careless appearance.

No. 26. Bows and arrangement of hair and cap prejudiced me. I don't think fat people look very intelligent as a rule.

No. 24. A heavy face portrays to me stolidity.

No. 9. Their caps pushed back on their heads make them all look simple-minded.

No. 8. Had a tendency to be harsh on very pretty faces or very ugly girls, thinking the former vain, the latter stupid.

No. 1. I don't like the looks of photograph No. 50.

No. 34. I like the faces of No. 17 and No. 45.

From the comments made in reply to Question 8 we discover that the eyes played a large part in the estimates of 18 judges, and most of them paid attention especially to the brightness and alertness of the eyes. Besides this factor the mouth, forehead, and general appearance seemed to be taken into consideration, as is illustrated in the following quotations from various judges:

No. 3. High foreheads and a bright, wide-awake expression usually symbolize intelligence to me.

No. 5. The expression of the eyes.

No. 6. I never think girls who look studious are very intellectual, but rather of lower intelligence.

No. 8. I judged by general appearance in the main, paying, however, special attention to the expression of the eyes and mouth.

No. 9. I judged the pictures by the expressions in the eyes and the size of the mouth.

No. 10. I judged by eyes and forehead for intelligence, by eyes and general expression for music, by eyes and noses for literary ability, by general expression for art.
No. 13. In some cases I made my decision by judging the girl from her general appearance. Then, too, I compared these girls with some I already knew and judged their ability in that way.
No. 15. The Latin types are associated in my mind with music and art.
No. 21. By an intelligent look I mean a general brightness of expression which betokens an alert and open mind.
No. 25. In choosing the girls with artistic ability I noticed the kind of collars they wore. In judging girls for their intelligence I noticed the expression of their eyes.
No. 26. I always notice people's eyes to see if they look bright and wide-awake for intellectual ones or whether they are dreamy as in the case of artistic temperament.
No. 27. The posture of the different people helped me as much as anything else to determine the results which I gave.
No. 29. In judging a person for intelligence, I think I went for the most part by the expression of their eyes, whether they looked as though they were paying attention at the time the picture was taken. Those who were gazing out into space with dull, expressionless eyes I put low.
No. 30. For intelligence I looked at their eyes first and then forehead. * * * For love of literature I judged from a bright open face. For neutrality I judged from the equality of all the features.
No. 31. * * * General flabbiness prejudiced me against a face.
No. 37. * * * For English Literature the general type chosen reminded me of Miss X.
No. 39. Those interested in science always seem especially particular in appearance as they must be in their study. Artists seem rather queer looking; musical students have more sentiment in their expressions than others. I judged by comparison with people I know and also by the expression of the eyes.

These illustrations will suffice to make us realize the astounding vagueness and indefiniteness in the perception of facial features upon which the casual observer is apt to base some-

times rather definite and fixed notions of the character traits of the people with whom he comes in contact. They furnish therefore an adequate explanation of the lack of agreement between the objective results and the subjective ranking by facial expression.

What conclusions may we draw from the facts presented? What answers do we receive to the questions asked at the outset of this paper? In the first place, we may repeat that the most outstanding of all the inferences is this that the average person has no basis whatsoever upon which to form any judgment of a stranger's intellectual capacity from a study of his features. It is likewise true that there is no agreement among the judges in their estimates of looks of intelligence. We have only to inspect our tabulations to realize that the average person when judged by fifty judges on his features only is practically sure of approximately thirty-five to forty different ranks. We have also found that there are faces whose expression is so unusual as to attract the notice of many judges; for example, photographs of Nos. 10, 11, 34, 21 and 50. There was no comment made by a single judge upon the first three, but Nos. 21 and 50 are criticised frequently for various peculiarities and are also placed very low in the scale for Intelligence. Of the five members of the faculty among our judges the four ladies gave a correlation coefficient of +.13 or larger and may therefore be said to be much better judges of girls' faces than either the men or the girls of the same age as those pictured. Even previous acquaintance with the faces judged seems to be of no help in estimating the degree of intelligence.

However, there seems to be a somewhat greater agreement among the judges in regard to special mental traits than in case of intelligence. Also the comments are much more definite with regard to the former, so that we may conclude that to the average judge the term intellectual ability is broader and vaguer and carries varied possibilities, whereas the ideas represented by the terms "musical ability," "literary ability," etc., seem to be more concrete and represent more definite characteristics to the judges. This is supported also by the fact that the term "Neutrality" was very vague and abstract to all and here the judges disagreed almost entirely.

There is no connection between age and judgment of faces. We have already pointed out that the lady members of the faculty were better judges than the girl students; the lady members of the Staff, however, were in no sense better than the students. Hence the superiority of the faculty ladies must be due to their experience in judging intellectual achievement. This is borne out by the fact that in judging the special mental abilities, in which they had no advantage of training and experience over the students, they were no better judges than the girls.

In judging faces for special talents the judges are more in agreement with each other in the selection of certain unusual looking faces, but they differ widely in the interpretation of this unusualness.

The one seeming exception, showing great agreement between subjective and objective ranking of photograph No. 15, which 26 judges considered highly talented in music and 14 others in art (which most judges seemed to consider a related talent) is partly explained by the fact that several judges noted a great resemblance between this face and a recent graduate of the college who had shown great talent for music. However, a number of first-year students who could not have known this recent graduate were also among the judges giving photograph No. 15 a rank among the first three, so that it seems unfair to explain this coincidence entirely upon a basis of mere chance.

Many judges seemed to agree rather definitely upon the interpretation of certain features as indicative of the Scientific Type. The only type we find them confusing with science is that of Neutrality. For instance, photograph No. 24 received 24 points for science and 11 for neutral, and No. 29 had 17 points for science and 8 for neutral. With very few exceptions those photographs receiving many points for aesthetic traits received very few points as either scientific or neutral and conversely.

The introspective comments and answers to questions reveal that our judges tried to find help in their ranking from all sorts of extraneous and irrelevant factors, such as tilt of the academic cap, type of collar worn and the like, besides such

features as beauty or fatness, posture, etc. Furthermore, our judges show the influence of all the current popular notions and ideas concerning the appearance of different types of mind. Besides the brightness of the eyes and the height of the forehead and the shape of the mouth they tell us that artistic and musical persons must be Bohemian in appearance and scientific persons plain and practical looking. Hence it seems almost impossible to get judgments of mental traits based exclusively upon the facial features and expressions and not to have them influenced by preconceived notions or popular traditions.

To summarize our conclusions with special reference to our main questions, we find (1) that the casual observer has no basis upon which to form a judgment of other persons' intelligence from their photographs, (2) that experience in judging intellectual progress renders one's judgment of facial expression slightly more correct with regard to intelligence only, but not with regard to special mental abilities, (3) that neither age nor sex of judge and judged are of any advantage in judging faces, and (4) that special traits, like musical, literary, artistic or scientific ability are slightly easier to judge than general intelligence and result in somewhat greater agreement of judges among themselves, whether their results are in agreement with the objective measures or not.

II.—THE EFFECT OF MUSIC ON THE IMAGINATION

MARTHA L. TEAGUE, '22, Experimenter

Most of the psychological studies on music so far have been concerned either with problems of musical interpretation or with the nature of bodily reactions to music, as changes in the rate of heart-beat, pulse, respiration, or distribution of blood supply. Lack of space forbids a detailed review of this work; only a few of the most important conclusions may be cited here. It has been found that music has a rather definite and remarkably uniform emotional content for the average listener and that individual differences are mostly in regard to variations of intensity. Therefore the chief "function of music is to indicate or produce a mood rather than to communicate a set of images" (according to MacDougal). To arouse a strong individual mood requires music of an extremely strong impressiveness with a well marked emotional tone.

Quite recently the Music Research Department of the Edison Laboratories at Orange, N. J., has inaugurated a series of experiments under the leadership of a prominent American psychologist, Dr. W. V. Bingham, Director of Applied Psychology at Carnegie Institute of Technology, Pittsburgh. The problem of this investigation was to determine "what music does." The result of this work was the publication of a list of 137 Edison phonograph records, divided into the following twelve series:

15	records	"To stimulate and enrich your Imagination"
14	"	"To bring you peace of mind"
10	"	"To make you joyous"
8	"	"In moods of wistfulness to bring you relief"
10	"	"To bring about jolly moods and good fellowship"
9	"	"In moments of fatigue to rouse your laggard energies"
11	"	"To induce and sustain the tenderness of love and its mood"
10	"	"To induce moods of dignity and grandeur"
12	"	"To revive the mood for tender memory"
13	"	"To inspire you with the mood for true devotion"
9	"	"To stir up or electrify your soul"
16	"	"To catch the childish fancy and make it merry with glee."

These results, like most of the studies of musical interpretation, have been based mainly upon the introspective reports of the listeners, while hardly any objective tests have been published to verify or substantiate such introspections by quantitative results. We have, therefore, chosen to attack this problem and to subject a few selections from the first Edison series of records to an objective and quantitative test, in order to ascertain whether or not these selections do have the stimulating and enriching effect on the imagination that is claimed for them. To prove such a claim requires two sets of facts: It will be necessary to show, first, that during or immediately after listening to Edison records of the first series the imagination produces greater effect than under ordinary conditions; and secondly, that listening to selections from any other Edison series does not have as great an effect as hearing selections from the first series. Another complicating factor is that of practice. Since each person had to be tested twice, once with and once without music, it is possible that the second test might have produced better results on account of the practice that the observer had received during the first test. Finally, there remains the necessity of giving two test forms of the imagination which are to be either of exactly the same degree of difficulty or at least of a definite and well measurable difference, so that accurate allowance can be made for it in the comparison of the two sets of results.

To provide for these four sets of conditions, we divided our 234 observers into four groups, and tested each of them with one set of conditions only. A group of 66 observers was divided into two Control Groups of 33 subjects each, designated X and Y. Control group X was tested with test-form (a) on the first day and with test-form (b) a week later, while Control group Y used the test-form (b) on the first day and (a) a week later. These control groups were not tested with the music at all, as the results from them were to be used as standards or objective measures of the imagination. The remaining 168 observers were tested without music on one day and with the music about a week afterwards or before. Group A had 90 observers who on their first day were given test-form (a) and no music, and on their second day test-form (b) and selections from the first series of Edison records. Group

B consisted of 40 subjects and the only difference in this group consisted in the fact that on the second day they had to listen to a miscellaneous list of Edison records. Group C had 38 subjects and they had test-form (a) with the same selections from the first series on their first day, while a week later they used test-form (b) without music. Of the 168 subjects tested with music 153 were drawn from all four classes of the student-body, while the remaining 15 were members of the faculty and their wives, and 3 of the 15 were men of the Music Department. The tests were made as a rule on small groups of subjects varying from 3 to 12, and nearly always at corresponding hours of the day.

For groups A and C we selected the following three Edison records from the first series:

1. *Miserere* (Soprano, Tenor, and Chorus).....No. 82516
2. *Calm as the Night* (Soprano Solo).....No. 80489
3. *Traumerei* (Violin-cello Solo).....No. 80071

For group B the following miscellaneous Edison records were used:

1. *Anvil Chorus* (Orchestra and Chorus).....No. 82516
2. *Go down, Moses* (Tenor and Chorus).....No. 80487
3. *Drink to me only* (Violin Solo).....No. 82184

These selections were played on an Edison phonograph (kindly lent to the Department for this purpose by the Oppleman Specialty Store of Lynchburg, Va.), which stood in a room adjoining the test-room, out of sight of the observers, but the door connecting the two rooms was wide open. We shall speak of the test without music as the normal period. On these days the test of the imagination was preceded, in place of the listening to music, by a monotonous mental activity requiring concentrated attention, which consisted in cancelling certain prescribed digits from three sheets, each containing 1000 equally spaced and equally frequent digits from 0 to 9, haphazardly distributed (Stoelting, No. 27011).

The effects on the imagination were objectively tested and measured by two well-known and standardized tests. The first is a test of sentence formation by the Masselon method and consists in writing during a limited period of time as many different sentences as possible, each sentence to contain three

prescribed nouns or verbs. The second is a word-building test and consists in writing during a limited period of time as many different words as possible, each word to contain certain prescribed vowels and consonants. An introspective account of our observers' moods was obtained by having them fill out a Mood Change Chart similar to the Edison Mood Change Chart, which is reproduced here on a smaller scale (see page 23.) The best idea of the course of the whole experiment on the two days can be given probably by quoting exactly the Instructions read to the subjects at the beginning of each day's work.

INSTRUCTIONS

This experiment is a psychological study of the imagination. Our problem is to find out how imagination can be influenced by intellectual activity and by musical enjoyment. The former will consist in checking off certain numbers from a sheet covered with digits in haphazard order. After the checking off is completed I shall ask you to use your imagination in the construction of sentences which are to contain certain words. Then, another test will consist in making as many words as possible out of a certain number of letters. More detailed instructions for these tests will be given later.

Before we start the experiment I want you all to fill in the items on this sheet of paper which is called "Mood Change Chart." State first your name and age and leading subject (or Vocation). If you have no major subject, put down the one you are most interested in or the one you are considering as your major. In the second item check off the present period and then fill in what you have been doing in the preceding periods of the morning (or afternoon). In the next item let us agree on calling the weather: ..... In the next item check off the mood in which you find yourself now. If none of the printed pairs describe your present mood accurately, supply your own descriptive term on the blank space at the end of this item. The last two items will not be filled in until after the experiment is finished. Fill out the Chart now. (After everybody has completed this, continue:) Now turn the sheet over and get ready for the experiment.

Cancellation of Digits. Each of you will have three of these sheets covered with columns of figures. Write your name and date on each sheet. At the signals "Ready—Now" you are to begin and cancel all the 7's and 0's on the first sheet. Be very accurate in your cancellations; do not omit any 7 or 0 and do not cross off any wrong figures; do not try for speed. When you have finished, turn your sheet over and rest, until new instructions for the next sheet are given. If anybody has not finished at the end of 5 minutes, I shall give the signal "Stop," for everybody to stop working. (After all are finished pause one more minute, then continue:). Get ready for the second sheet. Cancel all 9's and 4's, then rest and wait for the last set of instructions. (After another one minute's rest continue:). Get ready for the third sheet. Cancel all 5's and 8's, then rest as before.

Sentence Formation. Now you are to use your imagination in the construction of sentences which are to contain certain words. Three nouns or three verbs will be given. You are to write as many sentences containing the three words as possible. Each sentence must contain all three words, but how many others besides does not matter. The sentences are to be as varied as possible. Three minutes will be allowed. Begin with the signal "Ready—Now" and end at the signal "Stop," in the middle of a sentence or wherever you are. In the noun test you may use either singular or plural forms and possessive as well as nominative and objective cases. In the verb test you may use any form or tense of the verb, as to go, gone, will go, etc. There will be 3 sets of words. In test-form (a) the three sets are:

Citizen,	Horse,	Decree
Bell,	Ground,	Owner
Bless,	Destroy,	Write

In test-form (b) the three sets are:

Skill,	Modification,	Picture
Cup,	Fraction,	Money
Require,	Choose,	Run

Word Building. In this test you are to use your imagination in the formation of words which are to contain certain letters. From these six letters you are to make as many words as you can. All words must be English and proper names are permitted. You may use any number of letters from one to six in any one word, but none of the six letters prescribed may be used twice in the same word, and no other letters than the six are to be used. You will have four minutes for this test. Begin at the signals "Ready—Now" and finish at the signal "Stop."
In test-form (a) the six letters are: a, e, o, b, m, t;
In test-form (b) the six letters are: e, a, i, r, l, p.

Musical Enjoyment. As you will recall, our experiment is a psychological study of the imagination. Today this will be preceded by listening to several pieces of music, played on the Edison phonograph. As you hear the music, forget that you are making an experiment. Listen as naturally as you can and do not strain to pay attention or to produce any special effect upon yourself. Forget yourself as much as possible in listening, also your surroundings and close your eyes if you so prefer. Simply sit still and see if the music will produce any effect. At the end of each selection a rest-period of one minute will be given. After all three selections have been played, fill out item No. 4 on the Mood Change Chart, and then prepare for the test on the imagination.

Pledge to Silence. At the end of each day everybody is asked to pledge himself to keep silent about this experiment, as any discussion of it outside of the test-room may prevent others from participating in it.

MOOD CHANGE CHART

Name .....

Age:

Vocation or Major Subject:

2. Time: First Period (A. M.) .....
Second " " .....
Third " " .....
Fourth " " .....
Fifth " " .....

First Period (P. M.) .....
Second " " .....
Third " " .....
Fourth " " .....
Fifth " " .....

3. Weather: Dull ..... Bright ..... Cold ..... Warm .....

4. What is your mood **now**, immediately preceding the test?

Serious ..... Worried ..... Nervous ..... Sad .....
or or or or
Gay ..... Carefree ..... Composed ..... Joyful .....

Discouraged ..... Fatigued ..... Depressed .....
or or or
Optimistic ..... Unfatigued ..... Exhilarated .....

Or .....

5. What was your Mood **during** the test? .....

6. What is your Mood **now**, immediately after the test? .....

7. Please give any comments on the mood changes or the tests that you think would be helpful to us in the interpretation of the results: .....

.....

8. Pledge to Silence:

The Sentence Formation Test furnishes two numerical values, the average number of correct sentences per Subject formed by each Group, and the average number of words per Subject used in constructing the sentences. The quality of the sentences might also have been taken into account by assigning graded arbitrary values to varying degrees of originality. These 3 values could then have been combined into a single Index by dividing the product of the number of words times the number of sentences by the reciprocal value of the quality. But since the scoring of the quality is a rather subjective affair and liable to fluctuations, we used only the product of the number of sentences times the number of words as an Index of the imagination. To be sure such an Index, like any other that might be devised, has its disadvantages; the difficulty of having to deal with two values lies in indicating the exact difference in work accomplished on the two experimental days.

If we examine now the work of the 2 Control Groups in the Sentence Formation Test, we find that test-form (a), when used on the first day by group X gives almost as good a result as when used on the second day by group Y; it is therefore not subject to practice. On the other hand, test-form (b) on the first day gives results very inferior to those on the second day, when they are even slightly superior to test-form (a). We conclude, therefore, that these two test-forms are about equal in difficulty, but (b) is very much influenced by previous practice. In studying the individual records of the members of each group, we find that in both groups there are a few individuals whose results are the reverse of the majority. We have, therefore, divided each Control Group into two subdivisions, the 23 and 28 subjects respectively of X1 and Y1 giving much better results on the second day, while the 9 and 5 subjects respectively of X2 and Y2 do better on the first day. A very similar phenomenon occurs in the three main groups A, B, and C, which have, therefore, been subdivided in like manner into A1 and A2, B1 and B2, and C1 and C2. The gains or losses on the second day over the first day may be indicated in absolute differences between the two Indices and in per cent. gain or loss of the second day over the first.

In comparing now first of all the three main groups A, B, and C as wholes with X and Y, we find that on the days when

music immediately preceded the Sentence Formation Test, much lower records were made on an average in all three groups, indicating that music had an inhibiting influence on subsequent imaginative activity. The results are lowest for groups A and C, where the Edison records of the first series were used. Examining next the corresponding subdivisions we notice that out of the 90 subjects in group A, 53 (or about 58%) were unfavorably influenced by the music, and only 37 (or about 42%) gave better results after listening to the music. Similar results were obtained from group B, with the miscellaneous music, where 27 out of 40 (or 67%) were unfavorably influenced, and 13 (or 33%) improved with the music. Likewise in group C, where the music came on the first day, 35 out of 38 (or about 92%) showed lower records with it, and only 3 (or about 8%) gave better results with it. To sum up, out of the 168 subjects tested with music, 115 (or about 70%) were inhibited in their imaginative activity after listening to three musical selections, and only 53 (or about 30%) gave better results after hearing music. In other words, for every person whose imagination is enriched and stimulated by listening to music (and not necessarily to selections from the first series of the Edison records) there are at least two persons whose imagination is unfavorably influenced immediately after hearing such music. Our results from the Sentence Formation Test are quite decisive about this fact, and the only criticism that could be raised is that forming sentences does not test the various other activities in which the imagination may manifest itself.

How about, then, the Word Building Test? The results here are more easily calculated, because this test furnishes but one numerical value, the average number of words per Subject for every group. From the two Control Groups we learn that the two test-forms (a) and (b) are unequal in difficulty and also subject to practice. The individual differences are also very marked, for we find here in addition to the two subdivisions with opposite tendencies also a small group of individuals who with both test-forms construct the same number of words. This is also true of the 3 main groups.

If we study first the results from the five groups X, Y, A, B, and C, as wholes, we notice a striking resemblance between

X and A and B on the one hand, and Y and C on the other. In the case of X the second day's work is about 11% better than the first day's work, in A it is 10.1% better, in B 10.4% better, so that the previous listening to music for groups A and B seems to have had no influence whatsoever, while in group C (where according to Control Group Y a loss on the second day of about 7.4% should be expected) the actual loss was only 2%, thus showing that here the music had on the whole an unfavorable influence. In general, the results with the Word Building Test, therefore, confirm the findings with the Sentence Formation Test.

In regard to the individual records, matters are a little more complicated. While X1 shows a gain of the second day of 16.3% over the first day, A1 shows a corresponding gain of 20.9% and B1 of 27%. Likewise for Y2 the second day's gain is 24.3%, but for C2 on the day without music the corresponding gain is only 20.7%. In these three subdivisions, which contain 100 of the 168 subjects (or almost 60%), we find, therefore, a favorable effect of music, which, however, is by far greater with the miscellaneous selections than with those of the first Edison series. The unfavorable effect of music in the Word Building Test seems to be limited to the smaller groups, having a total of 52 subjects (or about 31% of all 168 subjects), while a still smaller group of 16 subjects (or about 9%) show no influence of music whatsoever. Six of these 16 had in the preceding Sentence Formation Test shown a favorable influence of music, the other 10 an unfavorable influence; in both groups the effect of the music had passed away.

This leads us to enquire how the other subjects stand when their performance in both tests is taken into consideration. We find that only 40 out of the 168 subjects improved in both tests with the music, and adding to them the 6 who improved in the first but remained constant in the second test, we have 46 out of the 168 (or about 27%) whose imagination is uniformly enriched and stimulated by listening to music. Likewise there are 35 subjects who in both tests have done less after hearing music, and adding to them the 10 who did less in the first test but remained constant in the second, we have 45 out of the 168 (or again about 27%) whose imagination has been uniformly inhibited by the music. The remaining 77 sub-

jects (or about 45%) show a conflicting or ambiguous influence of music. Thirteen of them improved in the Sentence Formation Test, but did worse with the Word Building Test, and 64 gave worse results with the Sentence Formation Test but improved with the Word Building Test.

In order to decide whether the selections from the first Edison series are superior to the miscellaneous selections or not, we should compare the results of subdivisions A2 and C2 with those of B2, in the Sentence Formation Test, and A1 and C1 with B1 in the Word Building Test. In both instances we find that the gain is decidedly greater with the miscellaneous selections, showing, therefore, that the claims made for the first series of the Edison Mood Music are not borne out by experimental facts and quantitative measurements.

We may, therefore, conclude from our results, first, that they show no superiority of the Edison series of musical selections over other miscellaneous selections in their enriching and stimulating influence on the imagination, and secondly, that this effect is limited to about one person out of four, and applies to music in general.

III.—THE INFLUENCE OF POETRY ON MOOD

VIRGINIA FITZGERALD, '22, Experimenter

This experiment is an attempt to extend the scientific study of the influence of music on moods, begun by the Music Research Department of the Edison Laboratories, into another field of art, namely poetry, and to enquire somewhat critically into the classification of moods employed in the Edison Mood Change Chart which has received wide publicity.

The Edison experiments mark a new departure in the study of moods and feelings. Up to this time experimental psychology had concerned itself chiefly with the attempt to discover and describe the nature of feelings and their bodily expressions. Although much work had been done in this direction, no satisfactory classification of feelings or moods had appeared. The very terms "mood," "feeling," and "emotion" are used loosely with overlapping meaning. While in the original Edison experiments on moods and music, conducted by W. V. Bingham, "much attention to terminology and definitions" was given, according to Bingham's own statement in the Edison pamphlet on "Mood Music" (page 29), the list of fourteen moods on the Mood Change Chart, seems hardly satisfactory from a psychological point of view, aside from the fact that these moods are not defined and merely arranged in seven pairs. But for the sake of possible comparison of our results with those of the Edison Laboratory we decided to employ the list in its entire length.

The question of the mood effect of poetry arises naturally from that of mood music, since both arts have a recognized emotional appeal and in part use similar means, such as rhythm and tonal cadences, at least when poetry is orally recited. But poetry is more intellectual and further complicated by the relation of thought-content to linguistic form and may appeal to the eye instead of the ear. Our main problem was, then, to determine whether listening to certain poems produces definite well-marked and uniform mood responses similar to the effect claimed for the 137 Edison records called "Mood Music."

In order to have the experimental conditions as nearly the same as possible, these poems should have been produced by Edison records, but since these were not available, the poems were read by the experimenter to groups of students under otherwise constant external conditions. The forty subjects belonged to the Sophomore and Junior class, their ages falling between 17 and 20 years. Among them, 18 were taking their major work in English or English Literature, the others were leading in Mathematics, French, History, Latin and Science. In addition to this group, a control group of forty students selected from the whole student-body, was used for one single test. We based our own Mood Change Chart on that of Edison, with certain modifications.* Before each test these charts were distributed to the subjects to be filled in according to Instructions.

Some difficulty was found in selecting from the great body of English poetry the poems best suited to our purpose. The experimenter tried to make the list as varied and representative as possible and at the same time avoid poems whose words suggested the emotional response. For convenience in giving the test, all of the poems were taken from Burton E. Stevenson's Home Book of Verse. The poems selected were, with a few exceptions, between twenty and seventy lines in length, so that at least ten poems could be read in an hour without producting fatigue in the listeners. A few poems were shorter, and a few of the longer poems were shortened by omitting unessential stanzas. Poems hackneyed by school use and poems with difficult dialect were also avoided. The poems range in style and quality from Browning and Shelley to Eugene Field and Carclyn Wells, and cover many lyric types and literary periods. This list was made primarily for college students with a considerable literary background; but for more general use several changes would probably be found desirable.

The poems were divided into ten groups of seven each, according to subject-matter. No exact literary classification was attempted, and in some cases the division may seem purely arbitrary. In selecting the poems for each weekly session, no

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A copy of our Mood Change Chart, somewhat reduced in size, has been given in the preceding study, see page 23.

regular scheme was followed, but abrupt changes of subject matter or emotion were avoided as far as possible, in order not to heighten the mood effect artificially by contrast. In most cases two poems of the same group were read in succession.

After all seventy poems had been presented to the group of forty students, one poem from each group was selected as being typical of the others, and these ten poems were read as a control test to forty other subjects. Our first group of forty subjects was divided into four sections, which met once a week at a regular period in the same class-room. The poems were read by the same Experimenter, who,in her reading tried to speak as distinctly and naturally as possible, accenting both rhythm and sense, but without attempt at elocution.

The following Instructions were given to all subjects:

"This is a psychological experiment to determine how one's mood may change by listening to poetry. The changes are to be recorded on the Mood Change Chart before you. First fill in under your name your age and vocation or major subject. If you have not yet chosen a major, write down the subject you are most interested in or the one you are considering as your major. In the second item check off the present period of the day and then fill in what you have been doing in the preceding periods of the morning or afternoon. In the next item let us agree on calling the weather at present ..... and .....

Before filling in the fourth item, your present mood, start to think about yourself and how you feel. In deciding how you feel, do not exaggerate. Then place a cross in the space by the word that you feel most accurately describes your feelings. Do not answer questions 5 and 6 at all.

As a poem is read to you, try to forget that you are making a test. Listen as naturally as you can, and do not strain to pay attention or to produce a mood. Try to forget yourself as much as possible in listening, and, if you prefer, close your eyes. If you are nervous and restless, for example, do not try to compose yourself or to force yourself to pay attention, but sit still and see if the poetry will produce any effect.

At the end of each selection a rest of at least thirty seconds will be given. During this pause write the number of the last selection heard in the blank after the word which describes the mood that you then have. If your mood is unchanged, put the number in the same blank space that you had written in before. If the mood has changed the number itself will indicate it. For example, if at the end of selection No. 4 you feel depressed, put the number 4 in the blank opposite the word "Depressed." If after selection No. 5 your mood is still the same, then write the number 5 after the 4. If the mood has changed to carefree, for example, put the number 5 in the blank opposite the word "Carefree."

After all selections for the day have been read, answer Item No. 7 by giving any additional introspections of your mood changes during the test and by adding any other comment you would like to make. After having finished everything, please sign a pledge to keep silent about this experiment, as any discussion of it outside of this room may prevent others from participating in it."

At the end of the whole experiment, after all subjects had completed all weekly sessions, a questionnaire was submitted to them concerning the meaning of the mood terms employed and similar topics. One of the modifications in our Mood Change Chart was the provision of a blank space for the subject to add any other descriptive mood terms. The Instructions and procedure for the control group were the same, but the different sections had only one experimental session.

The main results of this experiment were classified in such a way that the ten groups of poems ranged in the order from most to least uniform mood effects. Within each group the poems themselves are arranged in like manner.

In the first five groups of poems, the same four moods occur with varying frequency, namely: composed, depressed, sad, and serious, and we may speak of them collectively as the sober moods. The two groups of light verse and humorous poems arouse, on the other hand, most often the cheerful moods, such as amused, carefree, gay, and joyful. The last three groups of poems give rise to conflicting moods, such as carefree, composed, exhilarated, joyful, serious, and the like.

As to the individual poems which produce the most uniform and definite mood effects, we shall mention first those which in 50% or more of all subjects have aroused the same moods, and arrange them again in descending order, taking scattering of other moods into account:

1. Evelyn Hope (Group C,1) Prevailing mood "sad"
2. A Prayer (A,1) "serious"
3. Little Giffen (D,1) "sad"
4. Annabel Lee (C,2) "sad"
5. Limericks (G,1) "gay"
6. Kathleen Mavourneen (C,3) "sad"
7. St. Agnes Eve (A,2) "serious"
8. The House by the Side of the Road (A,3) "serious"

We may perhaps add to this list the following two:

9. Rory O'More (F,1) "gay" and
10. Tears, Idle Tears (H,1) "sad."

This whole list of ten poems may, therefore, be considered the first step in the compilation of a group of poems, classified on the same basis as Edison's Mood Music, which may be spoken of by way of analogy as "Mood Poetry." The main reason why

these particular poems produce such uniform and marked mood effects is probably to be found in the nature and strength of the "emotional tone" of the topics and language involved in them. This fact is supported not only by introspective comments of our subjects made especially in answer to the last question of the Mood Change Chart, but it is also borne out by the negative evidence that descriptive, philosophical, and simple narrative poems cause very slight emotional responses.

The large scattering of different and sometimes conflicting mood terms with many poems of our list is due to several causes. Amongst these we may list first the subject's mood preceding the experiment, because sometimes it seems to exert a marked influence on the subsequent mood reactions to the poems heard. For example, a mood of fatigue may persist throughout the whole session, or a mood of nervousness may make the subject feel "bored" with all the poems presented at that session. Sometimes metre and rhyme are mentioned among the causes of mood change, and sometimes the change is attributed to associations aroused by a poem at some earlier time. Again, if a poem is too familiar to a certain person, it makes the listener bored or indifferent. The case of previous associations with a poem is illustrated in the effect of the poem "Lord Ullin's Daughter," which reminded one of our subjects of a school declamation, while "The Post That Fitted" depressed one girl because she had recently visited an epileptic colony. Finally a poem of slight emotional appeal when heard after one of stronger emotional tone seems to be somewhat influenced by the mood of the preceding poem.

To the 14 mood terms found on the Edison Chart our subjects added "dreamy," "bored," and "amused." According to the absolute frequency with which these 17 moods occurred amongst our 80 subjects, we obtain the following rank order: (1) serious, 637; (2) composed, 497; (3) sad, 404; (4) carefree, 272; (5) depressed, 252; (6) gay, 241; (7) joyful, 161; (8) fatigued, 145; (9) exhilarated, 125; (10) optimistic, 109; (11) amused, 78; (12) dreamy, 62; (13) nervous, 61; (14) worried, 54; (15) bored, 39; (16) unfatigued, 32; and (17) discouraged, 24. The order remains the same if only the first group of forty subjects is considered. The order is but slightly changed if we arrange the moods by the number of subjects

who have experienced them. Accordingly we find the mood "serious" mentioned by all except one of the first group of subjects, next sad by 38, composed by 36, carefree and depressed by 34 each, gay and joyful by 31 each, exhilarated by 27, optimistic by 24, fatigued by 23, worried by 17, amused by 16, nervous by 13, unfatigued by 11, discouraged and bored by 10 each, and dreamy by 7.

These results, then, have solved our main problem, as they indicate to what extent listening to poetry is likely to produce definite and uniform emotional responses or moods.

A second and minor aspect of our problem was concerned with a critical examination of the mood terminology employed in the popular Edison Mood Change Chart. In order to obtain objective data for this enquiry each of the forty subjects of our first group was asked after the completion of all experiments, to answer the following

QUESTIONNAIRE

1. Define each of the seventeen mood terms.
2. Which of these terms mean to you practically the same thing?
3. Which of these terms express the strongest or deepest moods or feelings?
4. Classify all mood terms into pleasant, unpleasant, and indifferent.
5. Arrange the terms of the pleasant and unpleasant group from strongest to weakest.
6. Can you classify the moods in any other way? How?
7. Arrange the following ten subjects in the order in which they arouse you emotionally, from strongest to weakest:
   athletic contests (observed)
   dramatic performances (observed)
   fiction (read)
   landscape (observed)
   movies (observed)
   music (heard)
   original mental work (compositions or problem solving)
   paintings (observed)
   poetry (heard)
   traveling by rail.

The answers to most of these questions were also tabulated.

The first question was asked in order to find out how much agreement there is among people as to the precise meaning of the terms used. It is, of course, out of the question to enumerate here the different definitions offered; but a few examples must suffice to indicate the ambiguity in these terms.

Composed: Quiet; calm; undisturbed, not worried, not nervous; one's self; indifferent; firm; power of mind to think under any circumstances; nervousness in the background; at one's ease; rested; under control; carefree yet serious; not affected in any way; neither extremes of pleasantness nor unpleasantness.

Nervous: Ready to laugh at sadness and weep at humor; "crabby;" worried; excited; opposite of composed; worked up to an excitable state; not composed; nerves on edge; restless; agitated; unhappy; lacking self-control; irritable; tense; annoyable; unable to concentrate; "wrigglesome;" "slightly fearful;" "fidgety;" "unstrung."

Worried: Troubled; pondering; lack of attention; mind centered elsewhere; depressed and brooding; concerned over trouble; nervous and agitated; ill at ease; peace of mind disturbed; melancholic; distressed and anxious; distrustful and ill at ease; anxiously thoughtful; preoccupied with an unpleasant thought; bothered; upset; oppressed; depressed and discouraged.

From these samples it will be seen that there is much ambiguity in the interpretation of the mood terms. For example, "serious" was taken to mean either "thoughtful" or "slightly sad;" the arrangement of moods according to opposites is unnecessarily artificial, although several of our subjects defined some of the terms as the opposites of others; but even here there was no agreement as to what terms were thus antagonistic. Certainly the mood terms do not show the relations of moods to each other nor even the degree of intensity or strength of the moods designated.

It was found that there is greatest uncertainty in our subjects' minds concerning the precise meaning of the deepest moods of both the pleasant and the unpleasant kind; because here synonymous terms are mentioned most frequently. Thus, "depressed" is taken to be synonymous with "discouraged" by 18 subjects, with "worried" by 15, with "nervous" by 1, with "sad" by 4, and with "serious" by 1; only 1 person found no synonym for "depressed." The terms "discouraged" and "worried" are equally ambiguous, while among the pleasant moods "exhilarated," "joyful," and "gay" are synonymous to about 30 out of 40 subjects. Likewise the term "carefree" is equivocal. Several of the terms are also designated as meaning "indifferent."

Another aspect of the ambiguity of the mood terms is revealed in the answers to the third question. According to this result, "exhilarated," "joyful," "depressed," and "sad" are most often classified as the deepest or strongest

moods, but many of the other terms are also put into this group by from 1 to 10 of our subjects, indicating a great variety of interpretations of these terms.

Perhaps the greatest agreement occurred as to the affective character of the moods involved. The five moods "depressed," "discouraged," "worried," "nervous," and "sad" were uniformly characterized as "unpleasant;" "exhilarated," "joyful," "gay," "amused," and "optimistic" as "pleasant;" and in five others, namely, "serious," "composed," "dreamy," "unfatigued," and "carefree," there was an almost even division between "pleasantness" and "indifference," The moods "fatigued" and "bored" and the synonym "indifferent" were not included in this list because they represent, according to several explanatory comments at the end of the Mood Change Charts, an attitude of inattention and non-receptiveness to poetry, and are thus not moods aroused by listening to poetry.

The answers to the fifth question of our Questioannaire cannot very well be tabulated, since five moods were classified either as pleasant or as indifferent. But by taking the consensus of opinion as our guide we have arranged the fifteen moods into an affective scale, starting with the most unpleasant, proceeding to the less unpleasant, then the mostly indifferent or slightly pleasant, then the mostly pleasant or rarely indifferent, then the uniformly but slightly pleasant and ending with the most pleasant mood. The moods as thus arranged fall into the following order: depressed, discouraged, worried, nervous, sad, serious, composed, dreamy, unfatigued, carefree, optimistic, amused, gay, joyful, exhilarated. In this mood scale the middle third may be considered as either slightly pleasant or indifferent, according to the interpretation given to the term; "serious," for instance, may be understood as "approaching slight sadness," or as "a faintly pleasant thoughtfulness." This arrangement in a scale of moods is necessarily incomplete and uneven. The number of pleasant moods seems greater than the unpleasant; and there is also no way of expressing the differences in intensity in the consecutive steps. It seems to us, however, a more useful arrangement than the antagonistic pairs of the Edison Chart.

Since the answers to our sixth question did not yield any other satisfactory principle of classifying the mood terms, we may now revert to our first question of definition and attempt to bring together, in the case of each mood term, the most frequent descriptive phrases and synonyms mentioned by our subjects, in the hope that this collection, combined with its arrangement in a mood scale, may prove helpful to others interested in the study of moods.

MOOD SCALE

Depressed: Extremely unpleasant state of mental distress filled with evil foreboding which makes one unresponsive to pleasant stimuli; melancholic and pessimistic.

Discouraged: Very unpleasant state of despair, unready to make any effort to struggle; hopelessly downcast.

Worried: Pre-occupied with an unpleasant thought; brooding and agitated.

Nervous: A state of unpleasant physical and mental restlessness, with difficulty to concentrate and readiness to be annoyed by trifles.

Sad: Inclined to gloomy thoughts; a slight degree of depression; disturbed by sorrow.

Serious: Concentrating on and interested in thoughts aroused by stimulus; earnest, solemn, indifferent or but very faintly pleasant or unpleasant.

Composed: A calm, indifferent or but slightly pleasant state of watchful readiness and self-control.

Dreamy: A faintly pleasant state of distracted attention, somewhat drowsy, musing, wistful and disinclined to action and mental effort.

Unfatigued: A fairly pleasant physical and mental state of alertness or readiness to mental or physical effort; fresh and energetic.

Carefree: A pleasant state of irresponsibility, forgetful of troubles, light-hearted.

Optimistic: Inclined to pleasant thoughts; hopeful, cheerful, and happy.

Amused: Readiness to be pleased by trifles; on the look-out for the humorous, with a tendency to smile.

Gay: A state of pleasant light-heartedness and mirth, bordering on the mischievous or frivoluous; gladness with tendency to laughter.

Joyful: A very pleasant inner happiness with diffused and little marked external expression; pre-occupied with pleasant thoughts.

Exhilarated: Extremely pleasant state of excitement with marked external signs, such as laughter and boisterousness; "pep" and "thrill;" buoyant spirits.

The two other mood terms which were employed, but which we did not incorporate into the mood scale, may be defined as follows:

Fatigued: An unpleasant state of physical and mental weariness and inability to pay attention or to exert oneself.

Bored: An indifferent or slightly unpleasant state of passive annoyance, sometimes to the point of disgust.

These statements are not meant to be concise logical definitions or even accurate psychological descriptions of the different moods. They are merely an empirical collection of interpretations of the mood terms employed in this experiment, intended to serve as a possible starting point for a fuller psychological investigation of moods. We would, therefore, request any of our readers who have become interested in this problem of the effect of poetry on our moods, to apply our mood scale and our short list of ten mood poems, to their own life and to sit down in favorable moments of the day and read or have somebody read to them one or two of these poems in order to write down the effect upon their moods as defined or described in our mood scale. After ten or more such records have been obtained, the Psychological Laboratory of Randolph-Macon Woman's College, Lynchburg, Va., would be grateful to receive either the original records or exact copies of them for a continuation of this study. Further directions and details may be obtained from the Editor of these psychological studies. He would also gratefully accept answers to questions 6 and 7 of the Questionnaire as well as such details as are called for on our Mood Change Chart.

At present we have not sufficiently analyzed the answers to the last question of the Questionnaire and the possibility of receiving some answers from our readers forbids us to tell more of the purpose of this question, as this might influence future answers.

To summarize our main results, we may say that certain poems when read aloud produce definite and fairly uniform mood effects in a large number of people, and that this effect would have become even more uniform if the mood terms had been defined beforehand so as to be interpreted by everybody in the same way. A list of ten mood poems was made, on the basis of our results, which is analogous to the 137 records of the Edison Mood Music in that these poems will produce almost identical moods in the great majority of persons. Factors which prevent perfect uniformity in the mood effects of all poems are such as pre-existing moods, metre or rhyme of the poem, and pre-existing associations or emotional experiences connected with topics similar to those presented in the poems. We have also constructed an affective mood scale based largely upon the intensity of the pleasantness or unpleasantness of the moods involved. We have furthermore shown that mood terms are very ambiguous and variously interpreted by most people, and to avoid difficulties of definition we have attempted a list of descriptive phrases for each of the mood terms employed in this experiment.

In general our experiment has only confirmed what every lover of poetry has learned by pleasant experiences, that there are moods for every poem as well as poems for every mood. One knows beforehand what poems one "feels" like hearing or reading, just as every lover of music knows how he will be affected by this or that musical selection. But if our little study has stimulated a new interest in poetry in some of our readers or aroused in others a keener desire for mood analysis it will have gained a human value in addition to whatever value it may have from the strictly scientific psychological point of view.

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